

## DEVICE FOR MANUFACTURING CHEESE OF CHEDDAR TYPE

Manufacturing of Cheddar-type cheese takes place by the procedure that in a cheese kettle coagulation of the cheese curd is accomplished. The cheese mass, which thus consists of the curd and of whey, is poured from the cheese kettle into a cheddarizing or ripening tank. The tank retains the curd but lets the whey escape. The cheese mattress remaining on the bottom of the tank is left in the tank for 1-2 hours, in which time the bacterial activity causes in the cheese the sour taste characteristic of Cheddar-type cheese. The cheese mattress is cut into pieces by hand, and the pieces are repeatedly turned in the tank, in order to set free any whey, gases and air that have remained in the mattress.

The pieces cut from the cheese mattress are transferred to a conveyor and thence further to a mincing device, which cuts the pieces to small pieces about finger-size.

The minced cheese is transferred to the slating device, which usually consists of a drum rotatable about its axis, in which salt is fed among the cheese pieces.

The minced and sated cheese is packed into moulds having a size which is consistent with the size of the ultimate cheeses, and in which the cheeses are finally pressed. The pressing period is several hours or as much as a couple of days. The pressed cheeses are transferred into storage, where they ripen for several months.

Several considerable drawbacks are associated with the manufacturing process of Cheddar-type cheese described above. For instance, the cutting of the cheese mattress into pieces in the ripening tank, the turning of the pieces and their transfer to the conveyor require a great amount of manual work. Furthermore, the final pressing of the cheeses in separate moulds requires that a great number of moulds are available because the cheeses must remain under pressure for several hours or even up to two days. The initial cost of these moulds alone is considerable. But in addition it is necessary to provide in the cheese dairy a special pressing department, with presses. Apart from these capital costs, considerable running costs arise from maintenance of the moulds and from their washing after each use.

The aim of the present invention is to simplify substantially the equipment needed in the manufacturing of Cheddar-type cheese. The invention thus has reference to a device for manufacturing Cheddar-type cheese, consisting of a cheddarizing or ripening tank, a device for mincing the ripened cheese, a device for salting the minced cheese, a cheese press and conveyors for transporting the cheese from one phase to another.

A device according to the invention is characterized in that the ripening tank consists of a tank known in itself from the manufacturing of other types of cheese, which has been provided with a perforated bottom movable from the initial to the ultimate end of the tank, with a press plate located above and with a cutter for cutting the cheese mattress which rests upon the bottom, and in that the device comprises a conveyor extending from the ultimate to the initial end of the tank for reintroduction of the minced and salted cheese into the same tank and for final pressing of the cheese in said tank.

According to the invention the cheese goes into the tank twice. The first time the tank operates as ripening tank, and the second time it serves as press for the final pressing of the cheese. In both instances the cheese is in the form of a large mattress, which is an essential feature of the present invention. After the cheese mattress has been finally pressed, it is cut with a cutter into cheeses of ultimate size, which are taken into storage to ripen. No separate cheese moulds or presses are thus required. The manual work in the manufacturing of cheese has been completely eliminated.

The invention is described in the following with reference to the attached drawing, in which

FIG. 1 presents a device according to the invention in longitudinal section, and

FIG. 2 presents, viewed from above, three tanks placed side by side.

The tank 1 has rectangular shape and a length of several meters. The tank is confined by side walls 2 and 3 and end walls 4 and 5. The end walls and possibly also the side walls are perforated so that the whey may run off. The end wall 5 at the ultimate end of the tank 1 has according to FIG. 1 been raised into its upper position with the aid of power cylinders 30 and 31. At the ultimate end of the tank 1 there has been placed the cutter 33 which is movable by means of powder cylinder 32. The bottom of the tank consists of an endless wire 8 passing over drums 6 and 7, and which may consist of perforated metal strip, metal fabric, textile fabric or equivalent, through which the whey may flow. The drum 6 is the traction drum. Above the tank 1 there has been placed a press plate 11 movable with the aid of power cylinders 9 and 10 in vertical direction. The lower surface of this plate is perforated so that the whey may flow off during the pressure period.

After the ultimate end of tank 1 there has been placed the cheese mincing device 12. This consists of conveyors 14 and 15, between which there is a press roll pair 16, 18, which has been provided with disk-like cutters 17, 19. The distance of rolls 16 and 18 with reference to each other can be changed. It is not absolutely necessary for both rolls to have cutters if the cutters of one roll extend up to the other roll. There may also be several pairs of press rollers, of which part may be without cutters. After the rolls 16 and 18, there has been placed above the conveyor 15 and movable in vertical direction, the cutter 20, which has three cutting elements 21 transversal to the conveyor, the distances between which are mutually different. The number of cutting elements 21 may naturally vary, so that it is one or several. If there are more than one cutting element, it is advantageous to make their distances such that they can be varied.

After the mincing device 12 there has been placed a transversal conveyor 22 and, after this, an obliquely upwardly travelling conveyor 23, which extends up to the initial end of the tank. After this comes again a transversal conveyor 24 and, further, the salting device 25, which consists of a drum rotatable about its axis and having the shape of a cone widening from the initial to the ultimate end. The salting device 25 is positioned immediately above the initial end of the tank 1.

With a device according to the invention, Cheddar-type cheeses are manufactured as follows. Into the tank 1 from the cheese kettle (not depicted) cheese mass is